

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problems Mailbox.**

Amendments to the CLAIMS:

Claim 1 (currently amended). A system for using outside ventilation air to maintain indoor comfort and air quality in a building, comprising ~~an air delivery means~~ a means for air delivery, ~~damper means~~ a means for dampering between indoor and outdoor air sources, ~~sensor means~~ a means for sensing temperature, a means for interpreting sensed temperature to provide a suggestion of how to control said system, and ~~control means~~ a means for accepting control parameters and using said parameters to control said system, wherein:

said air delivery means comprises an air mover capable of variable speeds to deliver supplies outside air within said building to a building interior regulated by said control means for the purpose of providing to provide ventilation cooling;

said damper means includes at least two positions wherein directs airflow from said air delivery means using a first and second position, wherein said damper first position, a first of said positons causes said air delivery means to recirculate indoor air, and said damper second position a second of said positions causes said air delivery means to supply outside air to indoor spaces and to release a similar volume of indoor air to outdoors a quantity of outdoor air into said building and to release a substantially equal quantity of indoor air to the outdoors;

said sensor means includes an indoor air temperature sensor and an outdoor air temperature sensor, ~~both for measuring air temperature~~;

said control means includes a single user interface and a controller;

said at least one user interface and said controller are connected by a communication means that allows said controller to receive data from said sensor means;

said user interface includes buttons for establishing control settings and ~~said user interface~~ allows the user to establish preferred minimum and maximum indoor temperature settings;

said controller includes a microprocessor programmed with algorithms for predicting outdoor and indoor temperatures from temperature data obtained from said ~~indoor and outdoor temperature sensors~~ sensor means and from said minimum and maximum temperature settings;

said controller ~~conveying~~ conveys said predictions to said user interface where they are graphically displayed and from which a user of said system can select settings that maintain a desired comfort level and minimize needs for ~~cooling of the building interior using~~ vapor compression-based air conditioning of the building interior;

said algorithms calculate a ventilation limit temperature ~~which~~ that is greater than or equal to said minimum temperature setting and ~~which~~ that increases with decreasing building cooling requirements to prevent over-cooling, and calculate a preferred speed for said air mover; and

said control means initiates said ventilation cooling operation by activating said air delivery means and by changing the position of said damper means to said second position when the temperature sensed by said indoor sensor exceeds the temperature sensed by said outdoor sensor by a predetermined magnitude, and terminates said

ventilation cooling operation when the temperature sensed by said indoor sensor falls below said ventilation limit temperature[[:]] .

Claim 2 (withdrawn). The system of claim 1, wherein said user interface can display a predicted range of indoor air temperatures using a bar graph or other graphical representation;

Claim 3 (withdrawn). The system of claim 1, wherein said user interface can display a message to indicate whether control settings will result in air conditioner operation;

Claim 4 (withdrawn). The system of claim 1, wherein said user interface updates said button descriptions and functions according to previous pressings of said buttons;

Claim 5 (withdrawn). The system of claim 1, wherein "help" instructions are provided for the function of said buttons;

Claim 6 (withdrawn). The system of claim 1, further comprising a communications network connection by means of which weather predictions can be obtained by said control for use by control algorithms and/or display purposes;

Claim 7 (currently amended). The system of claim 1, wherein said air delivery means and said damper means can be operated at the command of the user to either re-circulate indoor air or supply outside air [[:]] .

Claim 8 (withdrawn). The system of claim 1, wherein said air delivery means includes a variable speed fan motor;

Claim 9 (withdrawn). The system of claim 8, wherein the ventilation cooling airflow rate varies proportionally with cooling demand;

Claim 10 (withdrawn). The system of claim 1 wherein outside air is cooled by an evaporative cooler to improve ventilation cooling capacity;

Claim 11 (withdrawn). The system of claim 1, wherein said user interface can display a graphical representation of energy costs and/or savings associated with the users choice of control settings;

Claim 12 (currently amended) The system of claim 1, wherein said air delivery means includes an air heating means selected from a furnace or heating coil for supplying warm air [[:]] .

Claim 13 (withdrawn). The system of claim 12, wherein said controller controls said variable speed fan motor to vary the rate of warm air delivery proportional with heating demand;

Claim 14 (currently amended). The system of claim 1, wherein said control means in cooperation with [[:]] said air delivery means [[:]] and said damper means cause a specified volume of outside air to be delivered to a building interior to maintain indoor air quality [[:]] .

Claim 15 (withdrawn). The system of claim 12, wherein heating temperature settings for four time periods can be graphically displayed so that all settings can be visualized at once, and wherein separate heating schedules can be applied for weekday and weekend periods;

Claim 16 (currently amended). The system of claim 1, further comprising a compressor-based air conditioner condensing unit and evaporator coil [[:]] .

Claim 17 (withdrawn). The system of claim 1, wherein a control selection can provide automatic operation of heating, ventilation cooling, or air conditioning as needed during unoccupied or vacation periods to maintain indoor temperatures between specified upper and lower indoor temperature limits that are set by the user;

Claim 18 (withdrawn). The system of claim 1, wherein the user can temporarily modify heating or air conditioning temperature settings and can set the duration that said settings are in effect;

Claim 19 (withdrawn). The system of claim 8, wherein individual maximum fan speeds for ventilation cooling, air conditioning, heating, and manual fan operation can be set using said user interface;

Claim 20 (withdrawn). The system of claim 16, wherein said controller operates said compressor-based air conditioning to lower indoor temperatures during morning hours in order to avert on-peak air conditioning energy use;

Claim 21 (withdrawn). The system of claim 16, wherein air conditioner operation can be curtailed during user-specified peak electricity demand periods set using said user interface;

Claim 22 (withdrawn). The system of claim 1, further comprising a communications network connection to electric service providers;

Claim 23 (withdrawn). The system of claim 22, wherein said electric service provider can remotely curtail air conditioner operation;

Claim 24 (withdrawn). The system of claim 22, wherein the current cost of electricity is communicated to allow display of real-time prices and/or projections of daily energy costs.

Claim 25 (new) A process for using outside ventilation air to help maintain comfort and air quality in an indoor space, comprising the steps of :

- (a) measuring the temperature of the air in said indoor space and the temperature of the outside air;
- (b) inputting, through a user interface, settings for upper and lower indoor temperature limits and a desired interior temperature;

- (c) storing said measurements and settings in electronic memory;
- (d) using a microprocessor-based controller and associated algorithms in conjunction with said measurements and settings to control a damper means and an air delivery means; and
- (e) controlling said damper means and said air delivery means based on said algorithms to:
 - 1) deliver outdoor air to said indoor space, at selected intervals when said outdoor air is cooler than said indoor air, to maximize the probability of maintaining indoor temperature between said upper and lower temperature settings and to minimize the need for vapor compression cooling; and
 - 2) recirculate indoor air to said indoor space to create air movement, to filter said indoor air, or to deliver vapor compression cooling.

Claim 26 (new) The process of claim 25, wherein controlling includes manual operation at the command of the user to either recirculate indoor air or supply outside air to said indoor space.

Claim 27 (new) The process of claim 25, wherein controlling includes heating the circulated air with a means selected from a furnace or heating coil.

Claim 28 (new) The process of claim 25, wherein said controlling also includes insuring that a specified volume of outside air is delivered to said indoor space to maintain indoor air quality.

Claim 29 (new) The process of claim 25, wherein said controlling includes operating a vapor compression cooling system to maintain said indoor temperature at said upper limit temperature setting.

Claim 30 (new) The process of claim 25, wherein said controlling includes operating an evaporative cooling means to maintain said indoor temperature at said upper limit temperature setting..

Claim 31 (new) The process of claim 25, wherein said controlling includes determining whether to use vapor compression, evaporative, or outdoor air means, or a combination thereof, to cool said indoor space.